COMMERCIAL USE OF GROWTH PROMOTANTS

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SUMMARY

The effects of treatment with growth promotants on liveweight gains over two years, carcass weight and sacral crest fat depth were estimated using 18 month old steers drawn from two locations and consisting of five genotypes.

From day 0 to 149 untreated controls and groups treated with 36 mg zeranol or 45 mg oestradoil 17β gained 0.631, 0.758 and 0.771 kg/hd/d ($P<0.005$), respectively. There was no significant difference between these groups from day 149 to 278 when daily liveweight gains averaged 0.547 kg/hd/d. On day 278 the 36 mg zeranol group was re-implanted, and liveweight gains to day 386 were 0.437, 0.579 and 0.448 kg/hd/d ($P<0.005$) in logical sequence. Live weights on day 386 were 445, 472 and 466 ($P<0.005$) for the untreated, 2 x 36 mg zeranol and 45 mg oestradoil 17β groups respectively.

Treatment of all groups with 36 mg zeranol on day 386 was followed by daily gains (kg/hd) of 0.380, 0.216 and 0.262 ($P<0.005$), in logical order, and by day 547 the live weights of the three groups were not significantly different. Further treatment with 45 mg oestradiol 17β on day 547 did not produce significant differences in liveweight gain during the following 200 days.

The various treatment regimes had no significant effect on either carcass weight or fat depth at the sacral crest site.

There was no difference in response to growth promotant by high grade Africander, Hereford x Shorthorn, Brahman x British and Africander x British or Brahman British x Africander British genotypes.

These results suggest that long term use of growth promotants may give no better liveweight response than an implantation programme to cover the final 200 days before sale.

(Key words:- Growth promotants, continuous treatment, genotype).

INTRODUCTION

Venamore et al. (1982), Hodge et al. (1983) and Mason et al. (1984) showed that a single treatment with either zeranol or oestradiol 17β increased liveweight gain under a wide range of pasture types and seasonal conditions. Responses to repeat implantations of zeranol about 90 days after initial implantation were smaller and less consistent, but increased liveweight gain over periods from 129 to 228 days (Salmons 1980, Hodge et al. 1983, Mason et al. 1984). However, Mason et al. (1984) found that extended periods of zeranol treatment did not necessarily increase final live weight at 2.5 years, when compared with treatment during the final 200 days before sale.

The effect of continuous treatment with growth promotants is of interest to beef producers but has not been thoroughly investigated. Results of an

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experiment that provides additional information on the effect of long term treatment with combinations of growth promotants are reported in this paper.

MATERIALS AND METHODS

Location

This experiment was located on Banana Station (24° 29'S 150° 06'E), a breeding and fattening property approximately 130 km south west of Rockhampton. The experimental animals grazed predominantly buffel grass (Cenchrus ciliaris) and green panic (Panicum maximum var. trichoglume). Stocking rates were one beast to 1.5 ha for the first 12 months of the experiment and then reduced to one beast to 1.8 ha until slaughter. The average annual rainfall of 690 mm is of predominantly summer incidence.

Experimental animals and procedure

The experimental animals were steers born during August to December 1981, and were drawn from two locations. One group was bred at Banana Station and were F1 Brahman X Hereford, F2 Brahman X Hereford (BH), F2 Africander X Hereford (AH) and F1 Brahman Hereford X Africander Hereford (BHAH). The second group was bred at the Belmont Research Station, CSIRO, Rockhampton and were transferred to Banana Station at about one year of age. The breeds represented in this group were F5 et seq. generation Hereford X Shorthorn (HS), Brahman X British (BX), Africander X British (AX), Brahman British X Africander British (AXBX) and high grade Africander.

On February 2, 1983, the steers were allocated to three treatment groups at random within origin and breed. Experimental design is shown in Fig. 1.

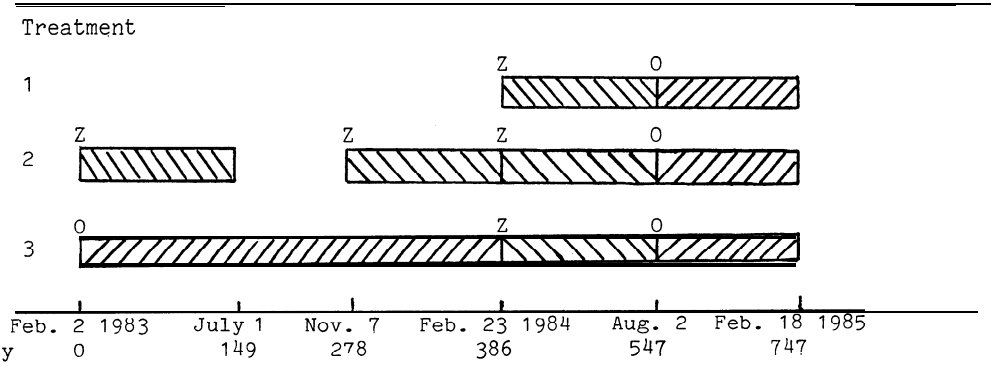

Fig. 1. Treatment groups and response periods.
Z = 36 mg zeranol (Ralgro, Cooper Animal Health Australia Ltd.)
O = 45 mg oestradoil 17β (Compudose 400, Elanco Products Co.)
The shaded areas depict the expected treatment response periods.

Age corrected live weights and liveweight gains were analysed by the least squares method (Harvey 1960) in three subsets. These subsets were according to

origin (Banana or Belmont) and genotype common to both origins.

There was no breed by treatment interaction in any of the three subsets of data which showed that responses to treatment with- growth promotants were consistent across all breeds. Consequently, the subset containing BH, AH and AHBH bred at Banana and BX, AX and AXBX bred at Belmont was used to estimate treatment effects on live weight, live weight gain, carcase weight and sacral crest fat depth. The partial regressions of live weight and liveweight gain on initial live weight were fitted. The initial live weight of the steers in this subset was 230±26 kg (±SD) and represents the live weight on day 0.

RESULTS AND DISCUSSION

The additional liveweight gains attributable to zeranol and oestradiol 17β were 20 and 22%, respectively, over untreated controls from February 2 to July 1, 1983 (day 0 to day 149) (Table 1). Mason et al. (1984) reported similar responses to the initial implant of zeranol in steers grazing at a similar stocking rate and pasture species. The difference between zeranol and oestradiol 17β was small and probably due to a depletion of zeranol release after approximately 100 days (Bennet et al. 1974), compared with the 400 day release period of oestradiol 17β.

Table 1 Effect of growth promotant on live weight and period gains by treatment groups

Date	Treatment 1	Treatment 2	Treatment 3
Live weights (kg)			
July 1, 1983***	326	342	346
November 7, 1983***	398	410	419
February 23, 1984***	445	472	466
August 2, 1984 NS	506	506	509
February 18, 1985 NS	643	636	641
Daily gain per head (kg)			
Feb. 2 - July 1***	0.631	0.758	0.771
July 1 - Nov. 7 NS	0.556	0.523	0.562
Nov. 7 - Feb. 23***	0.437	0.579	0.448
Feb. 23 - Aug. 2***	0.380	0.216	0.262
Aug. 2 - Feb. 18 NS	0.682	0.646	0.658
Number of steers per group	49	45	51

*** - (P<0.005) NS - (P>0.05)

There was no significant difference in daily liveweight gain per head between treatment groups from July 1 to November 7, 1983 (day 149 to 278) when the oestradiol 17β capsules in group 3 were, presumably, still active.

After zeranol re-implantation on November 7, 1983 liveweight gains of group 2 were 32 and 29% more than groups 1 and 3, respectively, during the following 108 days. Although oestradiol 17β gave expected responses from day 0 to day 149, the responses were small from day 149 to 278 and from day 278 to 386.

Response to zeranol treatment of all groups on February 23, 1984 resulted in highest liveweight gains in previously untreated steers, which negated liveweight advantages of previously treated steers. Previous treatment history had no effect on liveweight gains from August 2, 1984 to February 18, 1985.

Carcass weights and sacral fat depths were 343, 340 and 343 kg and 13.7, 13.7 and 14.0 mm for treatment groups 1, 2 and 3, respectively, with no significant difference ($P>0.05$) between treatment groups.

The combinations of different growth promotants used in this experiment are not as recommended by the manufacturers. But combinations such as these have been commonly used in commercial situations. These results, however, support the findings of Mason et al. (1984) that question the value of long term treatment with zeranol. The small response to oestradiol 17β over untreated controls from day 149 to 386 together with the trend from day 386 to sale also indicate a need to re-assess the long term use of growth promotants. Possibly the preferred approach would be to restrict use to the last 200 days before sale. However, this hypothesis should be tested by detailed experimentation.

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